

AMENDMENTS TO CLAIMS

1. (Currently amended) A communications node for establishing a plurality of logically ~~distinct communications~~ links running through the node contemporaneously to one or more remote nodes, the communications node comprising:

input switch means;

output switch means;

a plurality of communications resources connected between said input and output switch means, said plurality of communications resources including at least first and second communications resources adapted to deliver different communication services including packet-switched services and circuit-switched services, said packet-switched services delivered by a plurality of packet processing pipelines, each of said packet processing pipelines processing packets according to one or more packet protocols;

control means associated with said input switch means and said output switch means to establish logically ~~distinct~~ links through the node and configured to test for a route across a plurality of nodes, and if nodes of the plurality of nodes have required resources, to establish one or more logical links along the route across the plurality of nodes, each logical link comprising one or more channels of a physical link and, wherein each said logical link is configurable to can be selectively include one of the at least first and second communications resources switchable into circuit-switched services or demultiplexed via packet buffering enabling OSI layer 3 traffic to be carried without using OSI layer 2 link layer mechanisms and switched into one of the plurality of packet processing pipelines.

2. (Original) A communications node as in claim 1, wherein said communications resources include signal processing means.

3. (Original) A communications node as in claim 1 or 2, wherein said communications resources include packet processing means.

4. (Previously presented) A communications node as in claim 1, wherein said communications resources include a first plurality of communications resources adapted to serve one of said service types and a second plurality of communications resources adapted to another of said service types.

5. (Previously presented) A communications node as in claim 1, wherein the at least first communications resource is arranged to process a component of a synchronous input signal, and the at least second of said communications resources is arranged to process a component of an asynchronous input signal.

6. (Currently amended) A communications node as in claim 1, wherein a plurality of packets from a signal flow is processed by said ~~second~~ communications resource.

7. (Previously presented) A communications node as in claim 1, wherein said input switch means is arranged to receive at least one input signal partitioned such that it comprises a plurality of signal components, wherein said plurality of logically distinct links through the node are established by means of logically associated ones of the signal components.

8. (Original) A communications node as in claim 7, wherein said output switch means is configurable to receive signal components and switch said signal components onto at least one

output signal which partitions said signal components, wherein said logical links through the node are extended by means of logically associated ones of the components of the output signal.

9. (Original) A communications node as in claim 7 or 8, wherein said signal components are partitioned by means of one or more of: time division multiplexing; frequency division multiplexing; code division multiplexing; and space division multiplexing.

10. (Previously presented) A communications node as in claim 7, wherein said input switch means is configurable to switch a plurality of partitioned input signals contemporaneously.

11. (Previously presented) A communications node as in claim 7, wherein said output switch means is configurable to switch a plurality of partitioned output signals contemporaneously.

12. (Previously presented) A communications node as in claim 1, wherein one or more of said logical links spans more than two nodes such that it establishes a logical network.

13. (Previously presented) A communications node as in claim 12, wherein one or more of said logical networks is initiated and/or terminated at a node.

14. (Previously presented) A communications node as in claim 12, wherein one or more of said logical networks is initiated and/or terminated at an end terminal.

15.-16. (Canceled)

17. (Previously presented) A communications node as in claim 12, wherein said input switch means and said output switch means are configurable to circuit switch communications data on a logical link such that low latency transfer of said data is achieved.

18. (Previously presented) A communications node as in claim 12, wherein pluralities of said logical links are programmably aggregated and disaggregated by said node.

19.-27. (Canceled)

28. (Currently amended) A communications node as in claim 25 1, wherein a plurality of synchronous input signals are received at ~~said ingress~~ an input means and ~~said an~~ output signal from ~~said egress~~ an output means comprises components from different ones of the input signals.

29. (Currently amended) A communications node as in claim 1 or 28 ~~19~~, wherein the ~~second output~~ switching means supplies a plurality of output signals to ~~said egress~~ an output means, and wherein first and second output signals of the plurality of output signals comprise components from one input signal.

30.-32. (Canceled)

33. (Currently amended) A communications node as in claim 32, wherein said ~~second output~~ switching means is arranged to switch a packet supplied from the packet processing means in accordance with destination information associated with the packet by the packet processing means.

34. (Currently amended) A communications node as in claim 32 1, wherein a packet from an input signal is switched such that it appears as a packet in a plurality of output signals of the ~~egress~~ an output means.

35. (Currently amended) A communications node as in claim 32 1, wherein a plurality of packet flows each on a different logical link of an input signal are switched such that they appear as packet flows on different output signals of the ~~egress~~ an output means.

36. (Canceled)

37. (Currently amended) A communications node as in claim 34 1 or 2, wherein a plurality of packet flows on a logical link of an input signal are switched such that they appear as packet flows on logical links of different output signals of the ~~egress~~ an output means.

38. (Currently amended) A communications node as in claim ~~31 or 32~~ 1 or 2, wherein an input signal comprises packets belonging to a plurality of packet flows each packet flow being carried on a different logical link, wherein said first input switching means is operable to demultiplex the input signal to provide individual packet flows and supply a combined packet flow therefrom to an appropriate packet processing pipeline for processing in accordance with a predetermined packet processing protocol.

39. (Currently amended) A communications node as in claim ~~31 or 32~~ 1 or 2, wherein said second output switching means is programmed with switching information such that it receives packets from said first input switching means which have bypassed said packet processing means and directs them without reference to destination information in the packet.

40. (Currently amended) A communications node as in claims 1 or 28 49, wherein said at least one input signal comprises a first input signal which is timed synchronously with a timing reference signal of the node and a second input signal having a rate of receipt independent of said timing reference signal of the node.

41. (Original) A communications node as in claim 40, wherein said at least one input signal comprises a first plurality of input signals timed synchronously with a timing reference signal of the node and a second plurality of input signals having a rate of receipt independent of said timing reference signal of the node.

42. (Currently amended) A communications node as in claim 1, for receiving and transmitting signals comprising sets of signal components transmitted at intervals, wherein a set comprises a number of signal components partitioned from one another and wherein concatenated signal components in adjacent sets establish a number of logical links over a portion of a communications network, ~~said node comprising wherein the:~~

~~input switch means; output switch means;~~ control means is connected to said output switch means and programmable to cause selected ones of the partitioned signal components of a set to be aggregated, such that said aggregated signal components define an aggregated logical link having a bandwidth corresponding to a predetermined multiple of the signal component bandwidth.

43. (Original) A communications node as in claim 42, further comprising control means connected to said input switch means and programmable to cause partitioned signal components which have been aggregated at a remote node to be disaggregated.

44. (Original) A communications node as in any of claims 42 or 43, further comprising a plurality of signal processing means connected between said input switch means and said output switch means, wherein said input switch means is configurable to supply at least a component of an input signal to a selected one of said signal processing means.

45. (Original) A communications node as in claim 44, wherein one or more of said node processing means is arranged to process at least a signal component received on an aggregated logical link after signals transferred thereto have been disaggregated.

46. (Original) A communications node as in claim 44, wherein one or more of said node processing means arranged to process at least a component of a signal received on an aggregated logical link without disaggregating the partitioned signal components defining the aggregated logical link.

47. (Original) A communications node as in claim 44, wherein at least one signal processing means is arranged to support one or more of Ethernet, ATM, IP, IP over ATM, IP over Ethernet or unpacketised data.

48. (Currently amended) A method of setting up a logical link across a portion of a network comprising:

providing a plurality of communications nodes for establishing a plurality of logically distinct communications links running through the node contemporaneously to one or more remote nodes, the communications node including: input switch means; output switch means; a plurality of communications resources connected between said input and output switch means, said plurality of communications resources including at least first and second communications

resources adapted to deliver different communication services including packet-switched services and circuit-switched services, said packet-switched services delivered by a plurality of packet processing pipelines, each of said packet processing pipelines processing packets according to one or more packet protocols; control means associated with said input switch means and said output switch means to establish logically-distinct links through the node and configured to test for a route across a plurality of nodes, and if nodes of the plurality of nodes have required resources, to establish one or more logical links along the route across the plurality of nodes, each logical link comprising one or more channels of a physical link and; wherein each said logical link is configurable to can be selectively include one of the at least first and second communications resources switchable into circuit-switched services or demultiplexed via packet buffering enabling OSI layer 3 traffic to be carried without using OSI layer 2 link layer mechanisms and switched into one of the plurality of packet processing pipelines; and

routing a request to establish a logical link from a source node to a destination node over at least one of the plurality of communications nodes.

49. (Currently amended) A method of setting up an aggregated logical link, comprising:

providing a plurality of communications nodes for ~~receiving and transmitting signals comprising sets of signal components transmitted at intervals, wherein a set comprises a number of signal components partitioned from one another and wherein concatenated signal components in adjacent sets establish a number of logical links over a portion of a communications network,~~ said node comprising: input switch means; output switch means; control means connected to said output switch means and ~~programmable to cause selected ones of the partitioned signal components of a set to be aggregated, such that said aggregated signal components define an~~

aggregated logical link having a bandwidth corresponding to a predetermined multiple of the signal component bandwidth establishing a plurality of logical links running through the node contemporaneously to one or more remote nodes, the communications node including: input switch means; output switch means; a plurality of communications resources connected between said input and output switch means, said plurality of communications resources including at least first and second communications resources adapted to deliver different communications services including packet-switched services and circuit-switched services, said packet-switched services delivered by a plurality of packet processing pipelines, each of said packet processing pipelines processing packets according to one or more packet protocols; control means associated with said input switch means and said output switch means to establish logical links through the node and configured to test for a route across a plurality of nodes, and if nodes of the plurality of nodes have required resources, to establish one or more logical links along the route across the plurality of nodes, each logical link comprising one or more channels of a physical link and wherein each said logical link can be selectively switchable into circuit-switched services or demultiplexed via packet buffering enabling OSI layer 3 traffic to be carried without using OSI layer 2 link layer mechanisms and switched into one of the plurality of packet processing pipelines; and

routing a request to establish a logical link from a source node to a destination node over at least one of the plurality of communications nodes.

50. (Currently amended) A method of setting up a logical link across a portion of a network comprising:

providing a plurality of communications nodes for receiving at least one input signal comprising a plurality of components, each said component comprising part of a logical link over a portion of a communications network, the communications node comprising: ingress means for receiving said at least one input signal; egress means for outputting at least one output signal comprising one or more components of said input signal; one or more signal processing means connected between the ingress means and egress means, for receiving components of said at least one input signal and processing said components in accordance with a predetermined communications process; first switching means configurable to selectively cause a signal output from said ingress means to bypass one or more of said signal processing means en route to said egress means; second switching means configurable to direct signals output from said signal processing means to said egress means establishing a plurality of logical links running through the node contemporaneously to one or more remote nodes, the communications node including: input switch means; output switch means; a plurality of communications resources connected between said input and output switch means, said plurality of communications resources including at least first and second communications resources adapted to deliver different communications services including packet-switched services and circuit-switched services, said packet-switched services delivered by a plurality of packet processing pipelines, each of said packet processing pipelines processing packets according to one or more packet protocols; control means associated with said input switch means and said output switch means to establish logical links through the node and configured to test for a route across a plurality of nodes; and if nodes of the plurality of nodes have required resources, to establish one or more logical links along the route across the plurality of nodes, each logical link comprising one or more channels of a physical link and wherein each said logical link can be selectively switchable into circuit-

switched services or demultiplexed via packet buffering enabling OSI layer 3 traffic to be carried without using OSI layer 2 link layer mechanisms and switched into one of the plurality of packet processing pipelines; and

routing a request to establish a logical link from a source node to a destination node over at least one of the plurality of communications nodes.